GROWTH, INEQUALITY AND LABOR MARKETS IN LDCS: A SURVEY

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Abstract

This paper surveys the empirical literature on the association between growth on inequality in less developed countries, with a particular emphasis on labor market inequality. Cross-country studies failed to find a clear link from growth to inequality. Country-specific studies that focused on labor market inequality have shown that, with a few exceptions, wage inequality increases with growth. The paper argues that the methodologies used in many of the empirical applications, designed to investigate changes in labor market inequality in developed economies, should be adjusted to account for the unique properties of labor markets in LDCs.

JEL Code: F16, O12, O40.

Keywords: growth, inequality, labor markets.

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I. INTRODUCTION

This paper surveys the literature on changes in the income distributions in developing countries and their association with economic growth. It is an area where doubts and disagreements as to the proper role of government abound. The common wisdom, known as the Kuznets hypothesis (Kuznets 1955), claimed that inequality rises with growth at least at the initial stages of the growth process. Increased inequality is an undesirable consequence of the growth process because it may imply that certain population groups are left behind and do not enjoy the fruits of growth. At the same time, there is a view among economists, although not among all economists (Aghion, Caroli and Garcia-Penalosa 1999), that inequality hinders growth. Galor and Zeira (1993), for example, show that inequality slows output growth through capital market imperfections and indivisibilities in human capital investments. If this is true, the right policy prescription is to combine policies that promote aggregate growth and policies that redistribute income, but these two types of policies are likely to be contradictory. Hence, the choice of policy is reduced to the question of the right mix.

While some researchers found empirical support of the Kuznets hypothesis, many others found no robust significant effect of growth on inequality, and some even found opposite effects at least for some countries (Fields 2001). The different findings are due, at least in part, to different methodologies and data choices and definitions. Even when a significant Kuznets effect was identified, the remaining unexplained variance was quite large (Bourguignon 1990). If inequality does not change systematically with growth, governments can stop worrying about inequality and devote all efforts to promote aggregate growth, because it would benefit all segments of the economy, including those at the lower end of the income distribution (Dollar and Kraay 2002). However, Fisher (2003) pointed out that the effect of growth on inequality depends on the details of the policies that drive and accompany the growth strategy, and Aghion (2002) showed that growth-enhancing policies can be designed that increase inequality in the short run but lead to a more egalitarian distribution of permanent incomes.

The paper focuses on the labor market for several reasons. First, wages are a major component of household income, and labor is the major asset of the poor, especially in developing countries. Second, most existing data sets include labor income data that are more complete and accurate than other types of income such as property income and transfers. Finally, it is perhaps preferred not to include public income transfers in the analysis. This is because many countries adopt inequality-reducing policies that neutralize part of the market-driven changes in inequality, so that overall income inequality is more stable than wage or earnings inequality. Keane and Prasad (2002a), for example, found that after the transition in Poland, inequality in labor earnings increased markedly and consistently, while income and consumption inequality first declined and then increased gradually, thanks to successful social transfer mechanisms. Analyzing total income inequality may miss important inherent aspects of labor market inequality in such cases.

Many empirical studies attempted to analyze the variation of inequality over time and link it to changes in income. Existing empirical studies vary considerably with regard to several dimensions: (1) The countries covered. Studies range from cross-country studies through regional studies to single-country studies and even studies of regions and sectors within countries; (2) The type of data. Data sets range from a single cross-section through multiple cross-sections to longitudinal data; (3) The time periods covered. There are studies that deliberately focus on certain periods while other studies try to look at the longest possible time period; (4) The source of data. Data sources range from nationally-representative household surveys through all-inclusive labor force surveys to surveys of formal sector employees; (5) The measure of income used. Measures include GDP per capita,

per capita household expenditures, per capita household income, labor income, and wages; (6) The measure of inequality used. Examples of relative inequality measures include the Gini coefficient, the income share of the lowest quintile, and the ratio of the income shares of the highest and lowest quintiles. Other studies use poverty measures including the head count index and others. This variation implies also a great variation in empirical methods. As a result, it is not always easy to compare the results of different studies and it is not surprising that these results are mixed and often contradictory.

The purpose of this survey is to map the existing studies according to the above dimensions and, by evaluating the advantages and disadvantages of the different empirical approaches, suggest guidelines for a unified empirical approach to the study of changes in labor market inequality. The focus of the paper is on relative inequality and not on absolute poverty, because the latter is more or less dependent on the former: it takes a significant increase in inequality for growth to lead to increased absolute poverty. For example, Litchfield and Justino (2003) reported that between 1992/93 and 1993/94 inequality in Vietnam increased between 12% and 20%, depending on the measure used. The income share of the lowest decile of households went down from 3.5% to 3.3% during the period. However, average household income in the lowest decile increased by more than 30% in real terms. Hence, despite the increase in relative inequality, absolute poverty declined considerably.

In part II of this survey we start by reviewing the literature on the association between income inequality and growth. We briefly present theoretical arguments that support or refute the Kuznets curve, and then summarize the attempts to estimate it using cross-country data sets. In part III we move to discuss evolutions in wage inequality along the growth path. The advantage of this kind of research is that repeated cross-sectional micro data sets can be used to support or refute the findings of the cross-country studies. Although income inequality is a more comprehensive concept than wage inequality, wage is a major source of income, especially for the landless poor in developing countries. Modeling and estimating wage inequality and its evolution is much easier than doing it for other disaggregated income components. The methodology used in a line of studies dealing with U.S. wage inequality, including Katz and Murphy (1992), Murphy and Welch (1993a,b), Juhn, Murphy and Pierce (1993), Katz and Autor (1999) and others, can be applied to labor market inequality in developing countries with certain qualifications, and many researchers followed this line. This enables to use a simple demand and supply framework of the labor market, to identify changes in inequality between and within population groups, and to compute the relative contributions of various factors to the changes in inequality.

In part IV, we review a number of mobility studies that are based on longitudinal data sets. While not many of such studies exist in the literature, the availability of new data sets is likely to make this line of research more popular in the future. In part V we provide a critical discussion of the various empirical analyses of the association between labor market inequality and economic growth surveyed in this paper. Part VI sketches potential avenues for future research. We conclude that the ground is ready for a more comprehensive and unified empirical analysis of the evolvement of inequality along the growth path in low and middle income countries.

II. GROWTH, INCOME INEQUALITY, AND THE KUZNETS EFFECT

A. Theoretical Background

The Kuznets (1955) hypothesis states that inequality rises in early stages of development and subsequently falls as growth continues (inverted U). The fact of the matter

is that based on the restrictive set of assumptions used, this hypothesis is nothing but a statistical artifact (Bourguignon 1990). The model assumes a two-sector economy, denoted for simplicity as agriculture and manufacturing. It further assumes that income in agriculture is low but relatively equal (close to subsistence levels), while income in manufacturing is higher and relatively unequal. Workers are identical and cannot accumulate skills, so the income differentials are embedded in the industry of employment, not in the workers. Workers migrate from agriculture to manufacturing in order to capture the manufacturing industry rent, but there are costs of migration that make this process gradual. Most importantly, incomes are not subject to general equilibrium effects of changes in the size of the two industries. In essence, income is determined exogenously. Global inequality is made of two parts: inter-industry inequality and intra-industry inequality (which for simplicity can be thought of as nonexistent in agriculture and positive but fixed in manufacturing). Under these assumptions, migration of labor from agriculture to industry would raise mean income. In addition, if the agricultural sector is initially large, migration would increase inequality. As the migration process continues, the agricultural sector shrinks, and eventually inequality could start declining (Robinson 1976; Anand and Kanbur 1993, Fields 1993). Braulke (1983) showed that the inverted U curve could occur even if inter-industry inequality is shrinking along the growth path. Vicente and Borge (2000) showed that, under certain conditions, inequality can subsequently start rising again after the decline, above some threshold income.

This conclusion can be contested under a weaker but more realistic set of assumptions. For example, allowing for elastic labor demand in both sectors, migration would raise income in agriculture and lower income in manufacturing, thereby lowering the income differential (Giannetti 2003). While mean income still rises with migration, the direction of change in inequality becomes ambiguous. Other assumptions need to be relaxed as well. Skill accumulation is an essential ingredient of any growth process and cannot be ignored. Topel (1999), for example, used the terminology of skilled and unskilled sectors instead of agriculture and manufacturing, and therefore described the migration process as a process of skill accumulation and changes in labor force participation. In any case, migration, participation and skill accumulation should be considered as endogenous decisions of workers responding to income differentials. Since the processes involved are long-term processes, most relevant variables should be treated as endogenous. The treatment could be different for different types of countries. Educational attainment, for example, is endogenous in the long run provided that individuals are not constrained in their educational choices. Hence, perhaps the endogeneity of education is more plausible in middle-income countries than in low-income countries.

Several studies were able to obtain Kuznets-style empirical implications from dynamic theoretical models. Aghion and Bolton (1997) relied on capital market imperfections that prevent the poor from investing initially but become less binding as the economy grows. Perotti (1993) reached a similar conclusion using a political-economic argument. Galor and Tsiddon (1996) showed that inequality may be essential at early stages of the growth process but could eventually decrease as the benefits of growth reach lower segments of the society. Galor (2000) showed that inequality may increase with growth when growth is driven by physical capital accumulation, but inequality start decreasing after human capital accumulation becomes the prime engine of growth. Fishman and Simhon (2002) showed that a more equal income distribution can be beneficial for long-run growth by increasing investment in specialization and the division of labor.

Bourguignon (1990) showed that in a dual model of development, growth can be equalizing or disequalizing, depending on the price and income elasticities of the demands for the product of the traditional sector. Matsuyama (2000) presented a model in which inequality is monotonously increasing with growth under some configurations of the

parameter values, while under other values inequality is eliminated in the long run. Sorger (2000) showed that the effect of income inequality on growth could be positive or negative, depending on the elasticity of intertemporal substitution. Overall, the inverted U hypothesis of the association between inequality and growth cannot be obtained unambiguously. It therefore becomes an empirical question. It can be expected that between-country variation in these conditioning parameters would not permit an identification of a true Kuznets effect even if it in fact exists. We now turn to review the empirical attempts to establish the effect of growth on income inequality, using cross-country data.

B. Cross-Country Studies

The Kuznets hypothesis relates to the development of an economy over time. Still, given the absence of comparable data on a certain country over a long period of time, early empirical studies of the effect of growth on inequality used cross-country data, thereby mimicking the hypothetically longitudinal relationship by observing different countries with different income levels at a single point in time. Although not the first in this line of research, the study of Ahluwalia (1976) drew considerable attention. He used data on 60 countries, mostly for the 1960s, including 41 developing countries, 13 developed countries, and 6 socialist countries. The inequality measure used was the income share of the lowest 40% of the population, and it did seem to have a statistically significant Kuznets effect. However, Saith (1983) has shown that this result is extremely sensitive to data composition, and Randolph and Lott (1993) found that even if there is a Kuznets effect, it would take a long time for inequality in developing countries to start decreasing. Further doubts related to measurement issues have been raised by Ram (1988). Anand and Kanbur (1993) used the same data and compared alternative measures of inequality. Their results are portrayed in figure 1. While there seems to be support for the Kuznets hypothesis (see also Eusufzai 1997), it can be seen that the choice of inequality measure makes a difference, and the same is true for the choice of the countries included. For example, the regressions included a dummy for the socialist countries, and it turned out negative and highly significant. Despite this indication that the nature of inequality is significantly different in these countries, they were assumed to have the same growth-inequality profile as the rest of the countries in the sample. Even for the developing countries alone, one can conclude that the evidence in favor of a homogeneous inverted U curve is rather weak. Deutsch and Silber (2004) estimated one of the specifications used by Anand and Kanbur (1993), using data from 23 countries, and found statistically significant Kuznets effects. However, it can easily be verified that the rising portion of the Kuznets curve vanishes if one drops the poorest country from their sample (Rwanda).

Fields (1989) used data on 35 developing countries, of which 22 countries had more than one observation on the Gini coefficient, consisting of 70 spells. Growth rates were calculated using GNP per capita derived from national accounts. He found no statistically significant relation between inequality and growth. Papenek and Kyn (1986) used data on 83 countries from 1952 to 1978, of which 39 had more than one observation. Looking at both Gini coefficients and income shares, they found some support for the Kuznets hypothesis. Campano and Salvatore (1988) used data on 95 countries of which 68 are developing countries, 21 are developed economies and 6 are socialist countries, including a total of 143 observations. They found strong support for the Kuznets hypothesis which was robust to sample composition. Jha (1996) used data on 76 countries from 1960 to 1992, of which 61 had more than one observation. Inequality measures based on income shares did show statistically significant Kuznets effects, even in the subsample of developing countries. List and Gallet (1999) used panel data methods over a sample drawn from 71 countries covering the years 1961-1992. They found significant Kuznets effects, and by allowing for higher-

order polynomials, they also found that inequality goes back to an increasing path above a certain income level. Mushinski (2001) also advocates using higher-order polynomials in income or a nonparametric regression.

Ravallion (1995) questioned the quality of the data and the empirical approach used in the studies discussed above and others. He used a data set that was derived from nationally representative household surveys that were conducted during the 1980s in 36 developing countries. Mean consumption or income per capita was used as the income indicator. Consumption is the preferred indicator because it is supposedly measured more accurately than income. When consumption was not available, income was scaled up by the average propensity to consume according to national accounts data. The Gini index was used as the measure of inequality. To correct for the possible existence of country-specific fixed effects that may be correlated with mean income, he estimated the model using differences in variables between two time periods, using data from the 16 countries that had at least two observations in time. The results exhibited no association between inequality and mean income.

These results demonstrated the usefulness of a larger data set and especially multiple observations per country. Several subsequent attempts to study the Kuznets hypothesis followed this path. Ravallion and Chen (1997) re-examined this issue using a larger data set. This data set covered 67 developing and transition economies for the period between 1981 and 1994, including 64 consistent spells from 42 countries. They still reached similar conclusions. Their initial OLS estimates showed a significant negative effect of growth on inequality, but this effect vanished after eliminating countries from Eastern Europe and Central Asia. Deininger and Squire (1998) used data on 54 countries from the 1960s to the 1990s that had at least four observations on the Gini index and shares received by different quintiles in the population. Simple OLS regressions yielded statistically significant Kuznets effects, but the significance vanished once region-specific dummies were added. Estimating the regression with first differences also resulted in no significant effect of mean income on inequality. Estimating a separate regression for each country yielded significant Kuznets effects in only 10% of the countries. Li, Squire and Zou (1998) showed that most of the variation in Gini coefficients is explained by variation across countries, while only a small percentage of the total variance is due to variation over time. Savvides and Stengos (2000) used the same data to estimate a threshold regression model, splitting the sample endogenously into two regimes differentiated by a threshold GDP level, and reached similar conclusions. On the other hand, Barro (2000) was able to obtain a statistically significant Kuznets effect even after controlling for fixed effects and observed determinants of inequality.

Ravallion (2001) took the analysis a significant step further by allowing for different effects in periods of growth and periods of contraction. He used data from 50 developing countries for which at least two surveys existed, mostly in the 1990s. This data set included 120 spells of income expansion or contraction. He found no significant correlation between the Gini index and growth. In fact, about half of the expansion spells were characterized by increasing inequality and the other half by decreasing inequality. About two-thirds of the contraction spells were characterized by decreasing inequality and the other third by increasing inequality. This leads to the conclusion that one should search for the income-inequality association on a country-specific basis, although Deininger and Squire (1998) did exactly that and failed to find significant associations. Recently, Adams (2003) also failed to find significant effects of mean income on inequality using similar data, after allowing for regional-specific intercepts.

Galbraith and Kum (2002) raised a few concerns about the adequacy of the Deininger-Squire inequality data and propose using an alternative measure of inequality in

manufacturing wages. They estimated a cross-country logarithmic regression with year dummies and fixed or random effects, and corrected for serial correlation and lagged dependent variables. Their results indicated a world-wide trend of increasing inequality, starting in 1981, independent of levels or growth of per-capita output. Around this trend, they found that inequality mostly declines with per-capita output, except for a tendency for inequality to rise in the richest countries.

The evolution of empirical analyses surveyed in this section shows that data availability and consistent measurement are crucial to the analysis of growth on inequality (Ravallion 2003). Heterogeneity across regions and across countries was found to be of considerable importance. Here lies one of the shortcomings of this empirical approach: the selection of countries and time periods is not random. Data availability determines the inclusion of observations in the sample (Deininger and Squire 1996), but data availability could be statistically linked to economic performance. As Ravallion and Chen (1997) stated, "…the poorer a country, the more difficult it is to know just how poor its people are and whether their living standards are improving over time (p. 357)." They also noted that the size of a country influences the availability and quality of data. Hence, it is not clear that all countries in a given data set should obtain equal weights in the inequality regressions. In addition, Wade (2004) showed that excluding China from his data set changed the results from declining to rising world inequality. These shortcomings undermine the strategy of trying to find a cross-country Kuznets curve. However, as more and more high-quality household surveys in developing countries become available, there would be more possibilities to test the Kuznets hypothesis on a country-by-country basis.

Two recent studies have taken a somewhat different approach, using similar cross-country data. Lundberg and Squire (2003) found, using panel data techniques, that growth has a positive effect on inequality. Examining the determinants of both growth and inequality, they found that openness and civil liberties are both good for growth and bad for equality, while land redistribution may be good for both growth and equality. These results imply that looking at the independent effect of growth on inequality is inadequate, and point to policy mixes that are potentially pro-growth and pro-equality. Lopez (2004) used a similar strategy and added a dynamic component. His results imply convergence in inequality over time, and a negative effect of initial GDP per capita on changes in inequality. He also found that inequality converges faster than growth, meaning that a policy that affects both growth and inequality may have a stronger effect on inequality in the short run and a stronger effect on growth in the long run. Policies that increase both growth and inequality include financial development, trade openness, smaller government, and governance. Education, public infrastructure and macroeconomic stability increase growth and reduce inequality. In light of these studies, it could be that the lack of significant growth-inequality effects which characterizes most cross-country inequality studies is the net effect of redistributive policies and growth policies taken by governments (Bourguignon, 2004).

C. Regional Studies

Because of the variation found between countries in different regions, there may be merit for studying the Kuznets hypothesis on a regional basis. Fields (1994) looked at the situation in four countries in East Asia during the rapid export-oriented growth of the 1980s. He found that income inequality went down in Hong King, Korea and Singapore, but went up in Taiwan.

de Janvry and Sadoulet (2000) focused on 12 Latin American countries that were observed at least twice between the 1970s and the early 1990s. They allowed the effects of income on inequality to be different in expansion periods and in contraction periods. Also, because most Latin American countries adopted substantial economic reforms during the

period, they separated the expansion episodes to those before the reforms and those after, according to the specific experience of each country. The results showed that inequality, as measured by the Gini coefficient, was not significantly affected by growth. Other factors caused inequality to increase during the period, but initial inequality decreased the rate of growth of inequality. After allowing for different growth effects in expansion episodes and in contraction episodes, they found that inequality increased during contraction episodes but failed to decrease during expansion episodes. Hence, the overall increase in inequality in Latin-American countries was mostly due to contraction periods. The fact that inequality did not go down during expansion periods is of course something for governments to worry about.

Wood (1997) tried to reconcile the difference between the growth-inequality experiences of East Asia and Latin America. While in East Asia inequality decreased with growth, the opposite was true in Latin America. In both cases the acceleration of growth can be traced down to trade reforms, in East Asia in the 1960s and 1970s, and in Latin America in the late 1980s and early 1990s. Using wage inequality data, he found that the different inequality outcomes were not due to the inherent differences between East Asia and Latin America. Rather, they were due to the different time periods. While the trade reforms in East Asia resulted in an increased demand for unskilled workers who were at the bottom of the wage distribution, the Latin American reforms occurred after China and India were already competing with the low-skill sectors in other countries. Hence, in Latin America it was the middle class that benefited from the reforms, while the situation of low-skilled workers became even worse. As a result, an increase in overall inequality in Latin American countries was observed.

Overall, the analysis of the growth-inequality linkage on a regional basis is perhaps more informative than the analysis based on worldwide cross-country data, because we have seen that some of the variation observed in the cross section of countries vanishes after allowing for regional effects. However, the between-country variation within regions is still substantial and could potentially hide country-specific associations between inequality and growth. We therefore move to discuss single-country studies.

III. LABOR MARKET OUTCOMES: COUNTRY STUDIES USING REPEATED CROSS SECTIONS

A. Methodological Background

The paper by Katz and Murphy (1992) is perhaps not the first micro study of changes in labor market inequality, but it is probably the most comprehensive one. Using a simple supply and demand framework, they analyzed the relative wages and relative labor quantities of different types of workers (classified by gender, experience and education) over the years, and were able to explain many aspects of the changes in the U.S. wage structure. In particular, they showed that the observed outcomes were driven at least in part by increased demand for more educated and more skilled workers and for female workers. These demand shifts can be explained in part by changes in labor demand by sectors, and these are driven in part by changes in international trade in manufactured goods and by technological change. By breaking the period into several sub-periods, they showed that the pattern of changes in the wage structure differed substantially across sub-periods. Overall, they were able to break down the changes in wage inequality into within-group and between-group changes.

Several subsequent papers followed this line of analysis using U.S. data. Murphy and Welch (1993a) estimated the increased demand for skill over a longer period using occupations to classify types of workers, and elsewhere looked at racial wage inequalities and

husband-wife wage correlations (Murphy and Welch 1993b). Juhn, Murphy and Pierce (1993) focused on male wages and showed that the bulk of the increase in wage inequality was due to the increase in the returns to unobserved skills. Topel (1994) examined wage inequality within regional labor markets and concluded that while changes in labor demand stemming from technological change were relatively homogeneous, changes in labor supply varied across regions, in part because of increased female participation and concentration of low-skill immigrants in certain regions.

The Katz and Murphy (1992) competitive wage-setting framework can be summarized by the following simple model. Assume a heterogeneous labor force consisting of K types of workers, and write the demand system for labor in vector notation as $D(W_t,Z_t)$, where W_t is the vector of wages of the different types of workers and Z_t is a vector of demand shift variables. In equilibrium, supply equals demand for each type of workers: $N_t= D(W_t,Z_t)$. Differentiation yields $dN_t=D_w dW_t+D_z dZ_t$, where D_w, the matrix of cross-wage effects on labor demands, is negative semidefinite (assuming that the aggregate production function in concave). This means than in the absence of demand shifts ($dZ_t=0$), wages and labor supplies would move in opposite directions. A parallel rise in the supply of a certain type of workers and the wage of this type of workers clearly indicate a positive shift in the demand for this type of workers.

This framework enables to break down wage differentials over time or across types of workers into supply effects and demand effects, and this is what most of the empirical papers surveyed in this section essentially do. For example, many of the empirical studies discussed below looked for ways to explain the rising wage inequality in Latin America during a growth period following trade liberalization. The Katz and Murphy (1992) framework provides a simple answer: while demand shifted in favor of high-wage workers, the relative supply of these workers did not rise adequately, and this resulted in an increase of the wage gap. This answer points to an important issue that is sometimes ignored in the empirical literature, the dynamics of the labor market. While labor demand changes could be quite rapid in a globalized world, labor supply needs more time to respond, and in the meantime, considerable relative wage changes could occur. In addition, the supply and demand framework is an intuitive basis for analyzing the effects of policy: the effect of a policy should be examined with an emphasis on the differential effects on the supply of and the demand for different types of workers.

Although this framework is based on a purely competitive labor market, Katz and Autor (1999) showed that it can easily be extended to account for the presence of labor market institutions and for institutional changes over time. This extension is clearly relevant especially for low and middle income countries. However, one still has to be cautious with empirical applications of this framework in the developing world because of another reason. The empirical application of Katz and Murphy (1992) was based on changes in the wages of full-time salaried workers, and at some point they even ignored women when they analyzed experience wage differentials, because "potential experience is likely to be a worse indicator of actual experience for women than for men (page 72)". While this may be a reasonable simplification of the labor market in a country such as the U.S., Labor markets in developing countries are much less homogeneous and competitive than in the U.S., and it is not obvious that one can quantitatively ignore phenomena such as self employment, informal sector employment, and part-time employment, and frequent mobility among these categories and between them and formal full-time employment on one hand and non-participation on the other hand. The model of Lucas (1978), for example, predicts that the rate of self employment goes down as the economy grows. In addition, Banerjee and Newman (1993) showed that occupational choices are important for the growth-inequality path of the economy in the presence of capital market imperfections. These caveats should be considered

seriously in future empirical work, but despite them, the supply and demand framework remains the solid basis for modeling relative wage changes.

The studies discussed in this part of the survey dealt with wage and income inequality in developing countries, using repeated cross-sectional micro data sets. While only a few studies attempted to replicate the Katz and Murphy (1992) empirical methodology, most of them referred at least implicitly to the labor supply and demand framework. The majority of these studies dealt with Latin American countries, especially Mexico. This is not by coincidence. First, inequality in Latin America has been known to be significantly higher than in other parts of the world. Second, many Latin American countries adopted radical policy reforms during the last three decades. These policy reforms have led to the initiation of a growth process accompanied by structural changes that resulted in extreme changes in the structure of earnings, with potential implications for inequality. Among the Latin American countries, Mexico drew relatively more attention from American researchers, perhaps because Mexico is a natural trade partner of the US and hence the reforms seemed likely to affect American producers and consumers.

In the next three sub-sections, empirical micro studies analyzing wage and income inequality in various countries are reviewed. The articles vary by the coverage of the data sets used, going from manufacturing surveys that cover only large manufacturing firms, through urban employment surveys that cover only urban centers, to household surveys that are nationally representative, and finally to population censuses. Many studies compared data collected prior to a policy reform with data collected after it. The studies vary by the choice of inequality indicator. This choice depends on the data source and on the purpose of the study. Some papers studied the relative wages of different population groups, e.g. skilled and unskilled workers, rural and urban workers, and workers in different industries or regions. Other studies estimated wage regressions and then compared the coefficients of certain variables, e.g. level of education, across time periods or across sectors or regions. Some studies decomposed the inequality indicator into several components and examined their evolvement over time, while other studies examined shifts in the whole distribution of wages or earnings. We classify these studies according to the methodology used, beginning with relatively simple wage comparisons, continuing with analysis of coefficients derived from wage regressions, and ending with applications of various inequality decomposition methods.

B. Studies Analyzing the Evolution of Relative Wages and Inequality Indices

Inequality measures based on raw wage data serve to motivate more detailed analyses in most of the studies reported in this survey. Still, relating these measures to potential determinants can be informative in itself. This is the approach used by the studies listed in table 1. For Mexico, Feenstra and Hanson (1997) examined the share of wages obtained by skilled workers, and defined skilled workers as non-production workers. Using Industrial Census data, they found that wage inequality went down in Mexico from 1965 to 1985 and then went up. Hanson and Harrison (1999) looked at the same measure with data from Annual Manufacturing Surveys, this time defining skilled workers as white-collar workers. They found a less monotonous trend of wage inequality, with a decline from 1984 to 1985, a rise from 1985 to 1987, and a further decline from 1987 to 1990. Ros and Bouillon (2002) calculated the wage ratio of white-collar and blue-collar workers using household survey data and found a monotonous increase in wage inequality from 1988 to 1996 in all manufacturing sectors. Bell (1997) examined the standard deviation of wages for both white-collar and blue-collar workers using Annual Manufacturing Survey data for 1984-1990, and found a moderate overall rise in wage inequality across industries and regions. Inequality seems to have risen sharply between 1987 and 1988 and declined somewhat between 1989 and 1990. Robertson (2000) looked at the coefficient of variation of wages in National Urban

Employment Surveys between 1987 and 1993, and found a rising trend. Using Monthly Industrial Surveys, he also looked at the ratio of wages of non-production (skilled) workers and production (unskilled) workers. This ratio declined somewhat between 1987 and 1988 (stable DGP per capita), and fluctuated around a rising trend between 1989 and 1995 (growth period).

For Costa Rica, Gindling and Berry (1992) studied the evolution of wages and earnings over a period of a deep recession and then recovery. They examined the wage and earnings distributions across sectors and concluded that labor market institutions rather than market forces played a major role in the evolution of relative wages and earnings. Robbins and Gindling (1999) examined changes in the relative supply and demand for skilled workers, and found that supply increases were dominant in the period prior to the trade liberalization, resulting in a decline of relative wages. After the reform, despite a continued increase in the supply of skilled workers, increased demand driven by skill-biased technical change and capital inflows became dominant, resulting in an increase of relative wages of skilled workers.

Behrman, Birdsall and Szekeley (2003) studied the evolution of wage (including per-hour self-employment income) inequality across educational groups of urban males in 18 Latin-American countries between 1977 and 1998. They found that educational wage gaps increased in the 1990s, especially until 1994. A country-by-country analysis revealed that only three countries experienced decreased wage inequality. They did not examine the inequality-growth linkage but rather estimated the effects of various policy changes and reforms on the changes in wage inequality. They found that policy reforms were disequalizing in general, especially in the short run, with domestic financial market reform, capital account liberalization and tax reform having the strongest effect. Labor market reform also had a disequalizing effect but only in the short run. On the other hand, privatization reduced wage differentials, while trade openness had no overall effect on wage differentials. The results also suggested that technological progress rather than trade has been the mechanism through which the disequalization has been operating.

For Ghana, Canagarajah, Mazumdar and Ye (1998) showed that income inequality increased in the capital city of Accra between 1988 and 1992 while mean income declined, whereas inequality decreased in other parts of the country while mean income rose. The difference was explained by the large fraction of public sector employment in Accra. In any case, it seems like households at the low end of the income distribution benefited the most during growth and lost the most during contraction. Within-locality changes in inequality were rather small.

For India, Deaton and Dreze (2002) showed that per-capita expenditure inequality increased between 1993-94 and 1999-2000, mostly between states, but also between rural and urban households, and within the urban sector in each state. For China, Yao (1999) showed that rural-urban inequality was responsible for about half of the changes in income inequality in both rich and poor provinces. Within the rural sector, non-farm income was more unequally distributed than farm income, while within the urban sector, non-wage income was more unequally distributed than wage income. For Poland, Keane and Prasad (2002b) found that growth in earnings inequality within sectors and industries was the main source of increased overall earnings inequality during the transition to a market economy. A labor reallocation process from the public sector to the private sector has also contributed importantly to the rise in overall inequality. Much of the growth of earnings inequality was among the more educated workers.

The results of Kim and Topel (1995) stand in sharp contrast to many other findings. They found that wage inequality declined sharply during a period of rapid industrial growth in Korea. As in many other countries, growth was accompanied by expanding demand for

high-skill workers and also by expanding the skill levels of the labor force. But as opposed to the other countries, the rate of human capital acquisition was high enough to offset the impact of increased demand on wages and cause overall wage inequality to decline. McCulloch, Cherel-Robson and Baulch (2000) reached a similar conclusion for Mauritania. Inequality in per-adult equivalent expenditure went down while the mean expenditure increased remarkably. However, the change in inequality was very different for different population groups, while Kim and Topel (1995) found that the change in Korea was largely uniform.

C. Studies Analyzing Returns to Skills Based on Wage Regressions

Most of the existing empirical literature on changes in wage inequality is based on wage regressions. Some of the studies used the wage regression as a basis for inequality decomposition in various ways. Those are discussed in the next sub-section. The articles listed in table 2 used Mincer-type OLS log-wage regressions (see Willis, 1986, Chiswick, 2003, and Heckman, Lochner and Todd, 2003) to study the evolution of wage inequality. There are two major motivations for this approach. First, as explained by Katz and Murphy (1992), looking at the evolution of wage residuals rather than actual wages means looking at the evolution of wages of comparable workers (after controlling for gender, education, experience, and often also industry, occupation and location). Second, analyzing the evolution of a coefficient of a certain variable (e.g. years of schooling) can be interpreted as analyzing the evolution of the returns to this variable.

For Mexico, Revenga (1997) found considerable variation in wages across and within industries. Using panel data from Industrial Censuses for the years 1984-1990, she estimated OLS wage equations at the industry level and at the firm level. She found that prior to the trade reforms, workers in protected industries enjoyed a share of the industry rent as a wage premium. These premiums shrunk after trade liberalization. Since these were relatively unskilled workers, the skilled-unskilled wage inequality widened as a result of the trade liberalization.

Several studies used data from the Mexican National Urban Employment Surveys of various years to estimate wage regressions. Cragg and Epelbaum (1996) used a sample of full-time formal sector workers and found widening wage differentials by both education and experience. They estimated a pooled wage regression with industry and occupation dummies and interactions of education and experience, and allowed all coefficients to vary over time. They found that the increased dispersion of wages due to the rise of the education premium was mostly across occupations and to a lower extent across industries, and concluded that the relatively slow increase in the supply of skilled labor may have been responsible for the rise in wage inequality. Artecona and Cunningham (2002) used a similar sample and estimated a different wage equation, as a function of education and experience, in the initial and final periods. Then they analyzed the change in the mean difference in wage residuals between males and females across industries, and found that the increase in the unexplained gender wage differentials between 1987 and 1993 was mostly due to increased returns to experience of males.

Feliciano (2001) used a sample of all full-time workers and estimated year-specific wage equations that controlled for personal characteristics and included industry dummies, and found a decrease in the relative wage of less-skilled workers between 1986 and 1990. Despite the variations in periods, sample selection, and regression specifications among these studies, they all found that wage inequality in Mexico has increased over time. However, the survey periods covered both recession (late 1980s) and growth (early 1990s) episodes, so these results do not point to a pattern of dependence of wage inequality on growth. Psacharopoulos et al. (1996), using data from the nationally-representative National Survey of Households, compared changes in educational earnings differentials during a recession

period (1984-1989) and a growth period (1989-1992). They estimated separate earnings equations for males and for females in each year, controlling for schooling, experience and hours of work. Although the results are questionable due to the potential endogeneity of hours of work, they do suggest that educational wage differentials go down during recession and go up during growth.

Two recent papers have estimated wage regressions using population census data from Mexico. Chiquilar and Hanson (2002) used the 1990 censuses of population in both Mexico and the US to estimate wage regressions for Mexican workers and for Mexican immigrants in the US. Then they fitted the Mexican immigrants back into the estimated wage distrubution in Mexico according to their personal characteristics, correcting for labor force participation decisions in the two countries. They found that male Mexican immigrants in the US came from the middle to high portion of the wage distribution in Mexico, while female Mexican immirgants in the US came from the high portion of the wage distribution. They concluded that past immigration to the US contributed to the increase in wage inequality in Mexico. It may be interesting to apply similar techniques to study the effect of within-country rural-to-urban migration on wage inequality, given the different evolvement over time of wages and wage inequality of rural and urban workers in Mexico as reported by Alarcon Gonzalez and McKineley (1997) and by Bouillon, Legovini and Lustig (2003).

Hanson (2003) compared the population censuses of 1990 and 2000 in Mexico, using 1% random samples. He estimated separate wage regressions for males and females in each census year, based on a sample of wage earners with and without the self-employed, and found that wage dispersion increased in the 1990s both across educational groups and across regions. Using synthetic cohorts, he found substantial variation in wage changes across labor market groups defined by gender, age, education and region. In particular, relative wages of the young and educated workers living in the US border region increased the most during the 1990s.

Wage regressions were applied to labor force and household survey data from other Latin American countries as well. For Brazil, Pavcnik et al. (2002) found relatively small effects of trade reforms on overall wage inequality, mostly due to rising skill premium within industries that could be associated with skill-biased technological changes. For Costa Rica, Funkhauser (1998) examined the returns to education for males and females, in different regions and in the formal and informal sectors. He found changing patterns over time which were attributed to changing demand for skilled workers since the supply increased steadily throughout the period. For Chile, Beyer, Rojas and Vergara (1999) found an increase of educational wage premiums for males that were due to changes in the productive structure of the economy and relative prices, offset in part by increases in educational attainment. For Colombia, Attanasio, Goldberg and Pavcnik (2003) found increases in the returns to education that were homogeneous across industries, but also increased wage inequality within educational groups. Industry wage premiums changed in a way consistent with the expected effects of trade liberalization. Although there were no significant movements of workers across sectors, low-skilled workers seemed to move into the informal sector as a consequence of the fall in their relative wage. For Argentina, Galiani and Sanguinetti (2003) found that increases in wage inequality among educational groups within manufacturing industries during the 1990s were positively associated with the level of import penetration faced by the industry. However, this effect accounted for only 15% of the increase in the skilled wage premium during the period.

For other parts of the world, Rozelle et al. (2002) found that market reforms and increased competitiveness did not significantly affect gender wage differentials in rural China. For urban China, Zhang and Zhao (2003) documented sharp increases in the returns to education for virtually all types of salaried workers grouped by gender, age, industry,

occupation, province, and type of employer. For Poland, Keane and Prasad (2002b) found that the returns to education rose markedly during the transition, while the returns to experience declined in the early years of the transition. Quantile earnings regressions revealed that while the rise in the high school premium was relatively similar across earnings quantiles, the increase in the college premium was relatively larger at higher quantiles. For Taiwan, Lin and Orazem (2003) found notable increases in the returns to education, mostly for college graduates, and modest increases in the returns to experience, between 1978 and 1996, despite a rapid increase in the supply of skilled labor. However, Gindling, Goldfarb and Chang (1995) found that returns to education did not increase and even decreased somewhat for Taiwanese males between 1978 and 1991.

The analysis of wages of full-time salaried workers rather than total earnings was justified by Juhn, Murphy and Pierce (1993) by the desire to focus on the price of a homogeneous labor input. The question is whether this is appropriate for developing countries, where full-time employees constitute a relatively small fraction of the labor force. Several authors estimated regressions of earnings rather than wages. Ferreira and Barros (1999) did that for Brazil, and distinguished between wage workers and the self employed. They found that overall inequality remained roughly the same over a 20-year period, as a result of an increase in educational attainment and a parallel decline in the returns to education and experience. Blom, Holm-Lielsen and Verner (2001) estimated quantile earning regressions for Brazil which enable to obtain different coefficients for different segments of the earnings distribution. Their conclusions were roughly the same, although they showed a differential change in the returns to education by educational levels. Arabsheibani, Carneiro and Henley (2003) used a similar strategy and found that despite increased inequality in the returns to education, inequality did not rise due to concurrent increases in the levels of education and other labor-related endowments. Montenegro (2001) also demonstrated the usefulness of estimating quantile wage regressions, doing that separately for males and females in Chile. He found that the returns to education and experience varied along the wage distribution.

Not many of the researchers that estimated wage regressions seemed to be seriously concerned with selectivity issues. The exception is Ferreira and Barros (1999), who estimated a formal/informal choice model but did not correct the earnings equations for selectivity, claiming that the correction methods could do more harm than not correcting. Perhaps in developed countries such as the U.S. the selectivity into the labor market can be considered of secondary importance. In developing countries, however, with their imperfect labor markets, there is much more scope for selectivity correction based on the choice of formal/informal employment, the choice between wage work and self employment, and the choice between employment and household production. Indeed, conventional selectivity correction methods are not perfect, but there is scope for checking the robustness of the results to selectivity issues, and it is surprising that none of the researchers related to this issue.

D. Studies Using Inequality Decomposition Methods

Various methods to decompose wage or income inequality measures into several components have been proposed in the literature. Juhn, Murphy and Pierce (1993) decomposed the variance of earnings into the variance of wages, the variance of the quantity of labor, and a covariance term. They also decomposed changes in inequality into components related to observed differences among workers (education and experience) and unobserved components. Bourguignon, Ferreira and Lustig (2001) modified this method in order to look at various components of household income and also on household choice of income sources. Fields (2003) suggested a somewhat different method that can be applied to

levels or changes in income inequality. Most studies reported in table 3 used a variety of one of these decomposition methods.

Sanchez-Paramo and Schady (2003) applied the Katz and Murphy (1992) decomposition method in order to separate demand and supply factors. They used household data from five Latin American countries, and concluded that the rise in the relative wages of skilled workers was due to skill-biased technical change, and claimed that this effect was transmitted through trade. Bourguignon, Ferreira and Lustig (2001) studied the changes in income distributions in two Latin-American countries (Mexico and Brazil) and two East-Asian countries (Taiwan and Indonesia). They used two household data sets from each country, and tried to use comparable periods across countries (1980-1995 on average). They found growth rates of 1-2 percent in the Latin-American countries and 5-6 percent in the East-Asian countries. Income inequality went down in Brazil (urban sector only) and up in the other three countries, with the largest increase in Mexico. Hence, there is no clear regional pattern of inequality-growth correlations. They found that different factors, such as exogenous economic forces, macroeconomic shocks and policy, affected the income distribution in different directions and the observed change in the income distribution was the net effect. Their results imply that heterogeneity across countries was of considerable importance for the association between inequality and growth.

For Mexico, several researchers used data from the National Survey of Households. Alarcon Gonzalez and McKineley (1997) found that total income became more unequal over time but this took place mostly during the recession (1984-1989). Wage income, on the other hand, became more unequal only during the post-1989 growth period. Breaking the sample into rural and urban wage earners, they found that rural wage inequality went down during the recession period and partly recovered during growth, while urban wage inequality remained roughly the same during the recession and increased considerably during growth. Within the urban sector, manufacturing wage inequality increased in both periods, but increased more in the growth period. Looking at wage differentials between types of workers, they found that in some cases wage differentials have narrowed and in other cases they widened. This means that the bulk of the increased wage inequality is within types of workers rather than between. The interpretation is that the returns to unobserved skills have increased. Cortez (2001) found an increase in several alternative measures of wage inequality throughout the 1984-1996 period. Using a sample of workers whose main source of income was wage, he estimated log wage equations separately for males and females in each year, allowing for returns to education that vary by unionization status. He found that the increased returns to unionization were responsible for the increased wage inequality and not the returns to education.

Bouillon, Legovini and Lustig (2003) estimated household income regressions for 1984 and 1994 and found that the increased returns to education accounted for the largest share of the observed increase in inequality. Expanded differences between rural and urban incomes and between incomes in the southern region and in other parts of the country were also found significant. Fairris (2003) used data on full-time wage earners who worked in one job from the 1984 and 1996 surveys to estimate log-wage regressions separately for unionized and non-unionized workers in each year, correcting for selectivity due to the potentially endogenous union membership decision. He found that the equalizing effect of unionization on wages declined by half between 1984 and 1996, and this was responsible for about a third of the rise in wage inequality.

These studies, using roughly similar data, reached different conclusions about the evolvement of inequality in Mexico because they stratified the data differently and used different empirical specifications. Overall these studies suggest that inequality is evolving paralel to the growth process, and that this is due to increases in the returns to education or

decreases in the equalizing power of unions (or a combination of those). There seems to be merit for looking separately at growth periods and contraction periods, and at rural and urban workers.

For Brazil, Green, Dickerson and Arbache (2001) analyzed data on employed individuals from annual household surveys from 1981 to 1999. They found that real wages did not change much on average, but the returns to college education rose since 1992, despite the steady increase in the share of college educated workers. Overall wage inequality did not change much, and the fluctuations were mostly associated with changes in wage dispersion within educational groups. There was no change in industry wage premiums, but the fraction of females increased while the gender wage differentials decreased.

Gindling and Robbins (2001) examined comparable household survey data for Chile and Costa Rica. They found that wage inequality among male salaried workers increased in Chile and decreased moderately in Costa Rica. In Chile it was the highest 10% who did better than others, while in Costa Rica it was both the high end and the middle of the distribution relative to the lower part. Increased returns to education caused much of the increase in inequality in Chile, despite the opposite effect of the increase in educational attainment. There was also a significant portion of the increase in inequality that could not be explained. Contreras (2003) found that in a later period, 1990-96, inequality hasn't changed in Chile despite continued rapid growth. An inequality decomposition exercise showed that education contributed positively to inequality. Gindling and Trejos (2003) conducted a more detailed analysis of the Costa Rican earnings data over a longer period, and found that the decline in inequality in certain periods was explained by decreased educational premiums alone, while the rise in inequality in other periods was explained by increased educational premiums, increases in the dispersion of hours of work (especially in the informal sector – men working overtime and women working part-time), and changes in the gender wage differential. Other factors moderated the rise in earnings inequality – urban/rural, public/private, large/small firms, and experience and industry differentials all declined. For Argentina, Gonzalez-Rozada and Menendez (2002) assessed the effects of changes in labor market participation, unemployment, education, and returns to human capital on income inequality from 1991 to 2001. They found that unemployment accounted for a large part of the increase in income inequality.

In Korea, labor income inequality declined during a long period of rapid growth, up to 1994, and then started rising. Fields and Yoo (2000) analyzed the period up to 1993, and showed that changes in the returns to education, industry, occupation and experience all contributed to the decline in inequality. Kang and Yun (2003) analyzed the periods 1980-1994 and 1994-2000 separately, and found that changes in returns to worker and job characteristics were responsible for most of the changes in wage inequality. However, these changes accounted for almost three quarters of the change in inequality in the first period but only about a half in the second period. Changes in characteristics had only minor effects on the changes in inequality.

For China, Gustaffson and Li (2000) studied changes in the gender earnings differential during a period of rapid structural changes towards a market economy (1988-1995). While the earnings gap in urban China seemed to be smaller than in many other countries, it did increase over time due to increased overall earnings inequality. Most of the increase could be attributed to "prices" such as the rate of return on education, rather than to observed differences in determinants of earnings. Park et al. (2003) found, using similar data, that the rise in wage inequality in urban China from 1988 to 1999, concentrated among the top half of the wage distribution, was mostly due to rising returns to education and unobserved skills, and growing regional wage disparities. For Russia, Brainard (1998) found that wage inequality rose markedly after the transition to a market economy. There was a sharp rise in

the returns to education, while the returns to experience declined. Most of the rise in inequality among the lowest-paid workers was due to returns to unobserved skills, while most of the rise in inequality among the highest-paid workers was due to returns to observed skills, mostly education.

This completes the review of empirical studies of wage and earnings inequality based on repeated cross sectional data sets. The next step in the hierarchy includes studies based on longitudinal micro data sets. Such data enable to trace changes in the wage structure at the individual level over time, and therefore enable to examine the wage changes more directly than with repeated cross sections. These studies are reviewed in the next section.

IV. MOBILITY STUDIES USING LONGITUDINAL DATA

A. Conceptual Issues

Using longitudinal data to study the evolvement of inequality has multiple advantages for measurement, analysis, and policy implications (Baulch and Hoddinott 2000). Perhaps the most important advantage for our purpose is the fact that observing a group of individuals over time makes it possible to determine whether individuals at a certain part of the distribution are there permanently or temporarily. The extent of mobility is not less important than the level of inequality itself. Inequality may be less problematic in a mobile society where people who are at the lower part of the distribution are likely to move up the ladder in the not-too-far future. Even if the share of income accruing to households in the lower quintiles of the distribution is declining over time, it is difficult to draw conclusions from this without knowing to what extent the households that make up the lower quintiles are the same over time. However, high aggregate mobility is not necessarily sufficient to alleviate the adverse implications of increased inequality, because even in a highly mobile society there may be population groups who are trapped at the bottom end of the distribution. In addition, even high mobility across all income classes does not completely mitigate the inequality problem, because even a short-run negative income shock can have long-run welfare consequences on credit-constrained households.

At least two observations in time are needed in order to study mobility, and even this minimum requirement is not easy to find in most developing countries (Yaqub 2000). Hence, studies of economic mobility in developing countries are still relatively few. Despite the attractiveness of using longitudinal data, there are several drawbacks associated with their utilization. We already mentioned the short supply of adequate data sets. On top of that, panel data sets from developing countries are often small and not representative. For example, the sample of resettlement farms in Zimbabwe studied by Gunning et al. (2000) experienced income gains over and above the gains experienced by the larger farm population, while the country as a whole was more or less stagnant over the same period. There are also difficulties associated with attrition that become more severe in long panels (Scott 2000), and there is the issue of measurement error. If the outcome of interest is measured with error, the measured level of mobility will be higher than the actual one (McCulloch and Baulch 2000). Of course, measurement errors are not unique to longitudinal data, but they perhaps deserve more attention because longitudinal data provide opportunities to deal with measurement errors, that are not possible in cross-sectional data. Luttmer (2001), for example, found that after accounting for measurement errors, much of the inequality differences between Russia and Poland vanished. A final note relates to seasonality. Many households in rural areas of developing countries rely on agriculture for a living and agricultural production is seasonal in nature. Mobility between seasons has been found important in Ethiopia (Dercon and Krishnan 2000), Rwanda (Muller 2002) and Indonesia (Suryahadi, Widyanti and Sumarto

2003). Depending on the purpose of the analysis, this is an issue that deserves consideration. For example, if seasonal income fluctuations are not homogenous across households, care should be used in choosing the timing of the survey rounds.

B. Empirical Applications

A selection of longitudinal studies of economic mobility in developing countries is presented in table 4. We will now review the results of those studies. Dercon and Krishnan (2000) found considerable consumption mobility in rural Ethiopia despite a seemingly stable aggregate consumption distribution. Gunning et al. (2000) found income convergence in rural Zimbabwe during a relatively long period of income growth, with incomes of households in the lowest quintiles increasing the most. Jalen and Ravallion (2000) found that nearly 50% of poverty incidence in rural South-West China was transitory. Similar findings have been reported by McCulloch and Baulch (2000) for rural Pakistan, after a correction for potential measurement errors. Suryahadi, Widyanti and Sumarto (2003) found that while Indonesian households in the lowest and highest quintiles of the per-capita income or consumption distribution did not experience changes in their quintile positions in general, a large majority of households in the intermediate quintiles did move within the distribution across the survey rounds. The lowest quintile included mostly landless agricultural laborers and petty traders. Similar conclusions about mobility were obtained by Leibbrandt and Woolard (2001) for South Africa, and Woolard and Klasen (2004) found, using the same data, that poverty traps were associated with large household size, poor education and asset endowments, and poor access to employment. Glewwe and Hall (1998) found considerable consumption mobility in Peru. Their results show that education limited the losses of households in the recession years.

Grootaert, Kanbur and Oh (1997) looked separately at mobility in urban and rural areas in Cote d'Ivoire, and found that while human capital was the most favorable factor for welfare changes in urban areas, physical capital, especially land and equipment, was more important in rural areas. Luttmer (2001) found considerable income mobility in Russia and Poland, but showed that this is mostly due to transitory income. Still, his calculations imply that between 25% and 30% of households in the lowest decile of the persistent consumption distribution could move to higher deciles within a year. Lokshin and Ravallion (2000) found that Hungarian households bounce back rather slowly from transient shocks, but such shocks are not likely to create a permanent change in welfare. Deininger and Okidi (2003) found increased inequality, especially between rural and urban households, during a period of rapid growth in Uganda. Their analysis of income and expenditure growth revealed that educational attainment and initial assets were the key determinants of upward mobility among households. This finding has clear policy implications.

To summarize, many of the panel data studies reported here shared a similar goal: to disentangle permanent and transitory positions of households within the welfare distribution and quantify the extent of mobility of these households. Most of the researchers concluded that mobility is an important phenomenon. However, the data sets used differed in many dimensions, including representability, size, length, time period, and macroeconomic conditions, and the conclusions varied with respect to the degree and the speed of mobility. Hence, it is not easy to draw global behavioral conclusions on the basis of these studies. It is also not absolutely clear what are the ideal properties of panel data sets for the purpose of measuring economic mobility. For example, short panels have the disadvantage that they only enable to measure short-run mobility in a specific period, while in long panels we can measure long-run mobility but it is difficult in this case to associate the outcomes with a specific growth or contraction experience in the economy. The ideal data set would be

representative, large, long, and include many time periods, but how many of those properties can one find in a single data set in developing countries?

V. DISCUSSION

Economic theory does not predict unambiguously the direction of dependence of inequality on economic growth. However, the direction and scale of this dependence are important for policy decisions and evaluation. This explains the vast number of empirical studies devoted to this issue. Cross-country studies failed in general to find a statistically significant effect of growth on inequality. Evidently, there is substantial variation across countries, and later studies that used richer data sets and tried to control for this variation found that they were able to reduce the unexplained variation in the data but could not attribute a significant part of the explained variation to growth. Perhaps the exception is the study of de Janvry and Sadoulet (2000) that identified an increase in inequality in periods of negative growth only, in Latin America. Ravallion (2001) used a similar approach with data on all developing countries and could not reach a similar conclusion. Perhaps the earlier data observations used by de Janvry and Sadoulet (2000) would not have satisfied the quality criteria used by Ravallion (2001). In addition, it could be that growth and recession episodes in countries outside of Latin America were too short and too shallow to identify statistically significant effects.

A common shortcoming in this line of research is that the coverage of the data set is determined by data availability, which could be a function of the variables of interest. As a result, none of the cross-country regressions is based on a random sample of countries and periods. Ideally, one would like to have all countries in the data set and for the same periods, and even then perhaps it is necessary to use population weights. This of course is far from reality. The only feasible solution for this shortcoming is to abandon the country-wide strategy and study the dependence of inequality on growth at the country level. As dependable time series data on inequality are rather short, the solution may be to go to micro data.

Many researchers studied the evolution of inequality using micro data, mostly by comparing similar data sets from different periods. The advantage of this strategy is the richness of micro data sets that enables one to look not only at global inequality but also at the experience of specific population groups. The disadvantage is that whatever changes in inequality are found, they are not easily linked to growth. One way to go around this disadvantage is to adopt the position that it is not growth itself that affects inequality but rather the processes that influence growth. This is a reasonable approach, especially in developing countries, given that any two countries with similar growth rates over a given period could have remarkable differences in the underlying processes in the economy. This approach was also adopted occasionally in cross-country studies, for example by Behrman, Birdsall and Szekeley (2003) who studied the effects on inequality of a number of policy variables and found various significant effects.

Micro studies can vary quite a lot in many dimensions, and the studies surveyed in this paper demonstrate this point. Let us focus on studies that compare micro data sets on the same population in two different periods. First, the question is the time differential between the periods. A short time differential results in relatively small changes in the variables of interest. A long time differential may encompass many changes that occurred in the economy and hence make it difficult to identify the source of inequality changes. It is not clear what the "optimal" time differential is.

The type and coverage of the data are also pivotal. It is common to think that inequality is most importantly influenced by labor market outcomes. Hence, many researchers focused on measuring and analyzing labor income inequality rather than total income inequality. One possible data source is employment surveys that report wages. There are several problems associated with the use of such data in developing countries. First, these surveys frequently exclude the informal sector, which is likely to be quantitatively important in developing countries (Galli and Kucera, 2004). Second, they condition on the active labor force, and this may be problematic in economies with relatively low labor force participation and economies with abundant self employment. On the other hand, surveys that include self-employment income may be subject to larger and nonrandom measurement errors. In this case it may be necessary to look separately on the self-employed, but this requires modeling the self-employment decision and controlling for it. A final disadvantage of employment surveys is that they use the individual worker as the unit of analysis, while it is more appropriate to study inequality at the household level, especially in developing countries.

Household surveys normally include labor income from all sources, but they are not always inclusive. Sometimes they exclude rural areas, and even if rural areas are included, it may be desirable to look at urban and rural inequality separately. Alarcon Gonzalez and McKineley (1997), for example, found different evolutions of inequality in the urban and rural sectors. This approach, however, may require accounting for endogenous rural-urban migration, which is rarely possible with such data. An indirect way of evaluating the effects of migration on inequality was suggested by Chiquilar and Hanson (2002). Population census data are not conducted frequently but may have advantages over household surveys because of the large number of observations. The size of the data set enables to analyze inequality changes nonparametrically by using synthetic cohorts, as has been done by Hanson (2003). This may even serve as an alternative to longitudinal data studies for studying mobility.

As in many areas in economics, longitudinal data seem to take the analysis of inequality a step forward. Panel data enable to distinguish between permanent and transitory positions of households within the welfare distribution, and to evaluate the nature and degree of mobility. However, panel data sets are rarely satisfactory with regard to the possibility to generalize the results to the population at large. Perhaps the way to look at panel data studies should be as supplementary to studies of repeated large and representative cross sectional data sets. Of course, over time it is expected that more and better panel data sets will become available. Meanwhile, perhaps the potential of comparing repeated cross sections has not been sufficiently realized. The synthetic cohorts approach used by Hanson (2003), that mimic individual mobility by following identical narrowly-defined groups of workers over time (section II.C of this paper), could be applied to other large cross-sectional data sets as well. The decomposition methods of Bourguignon, Ferreira and Lustig (2001) and of Fields (2003), that enable one to quantify the contributions to inequality of various observed and unobserved factors (section II.D) could be applied to data sets from additional countries.

Perhaps the fact that so many studies reached quite few common conclusions about how inequality is evolving in developing countries means that we should get down to the basics and try to understand better the processes that affect household income and well-being. From the labor market perspective, it is not sufficient to study how wages are determined but also how workers choose jobs and hours of work, and even the level of schooling, and how individuals and families allocate time between wage employment and self-employment (including household production). In rural areas, care should be given to the evolvement in farm labor productivity and of assets other than labor (especially land), and to the determinants of out-migration. After all, these are the building blocks of household income and its distribution.

VI. WHERE DO WE GO FROM HERE?

This survey looked at the evolution of the research on growth and inequality along different dimensions, from cross-country studies to country-specific studies, from employment surveys through household surveys to population censuses, and from a single cross-section through repeated cross-sections to panel data sets. Cross-country studies do not seem to converge to consistent results, and even if they do, it is difficult to come up with policy conclusions on this basis. Exceptions are the recent studies of Lundberg and Squire (2003) and Lopez (2004), but this is probably as far as one can get. Mobility studies using panel data sets, on the other extreme, seem to be the answer for the future, but it would take years before satisfactory coverage of the developing world becomes practical. Hence, in the short run we have to look for the answers in the domain of the repeated cross sections.

With large enough repeated cross-sections one can imitate mobility studies with synthetic cohorts as in Hanson (2003). Even without synthetic cohorts, the potential of repeated cross sections has not been fully utilized up to now. The existing stock of micro data sets from low and middle-income countries seems sufficiently large and diversified to justify an attempt to conduct a unified analysis of inequality using comparable surveys from a number of countries and time periods. We have seen some of this in the studies covered in this survey, for example the study of Bourguignon, Ferreira and Lustig (2001), but more progress can and should be achieved in this direction.

In addition, we should be able to better address issues that are more empirically important in developing countries, such as self-employment, rural-urban migration, and female's access to formal employment. These issues have a bearing on income inequality, and can be handled with adequate data. An example is the treatment of wage and self-employment as endogenous decisions (Kimhi and Panzer, 2000). Several studies looked at the impact of international migration on inequality (Friedberg and Hunt, 1995), and the methodology could probably be adapted to internal migration as well. Perhaps the way to start is to demonstrate, using adequate data from a certain country, the empirical implications of not controlling for labor force participation, self employment, internal migration, etc.

An interesting policy-relevant question that comes out of this survey is why in only a few countries, most notably Korea, has educational attainment been able to expand sufficiently to reduce wage inequality, in response to the increased demand for skills. Education policy is a good example to a policy that is potentially both growth-promoting and inequality-reducing. The question is to what extent the difference between the outcomes in Korea and other countries is due to policy differences or institutional differences, and whether policy can help low and middle income countries mimic the Korean success story.

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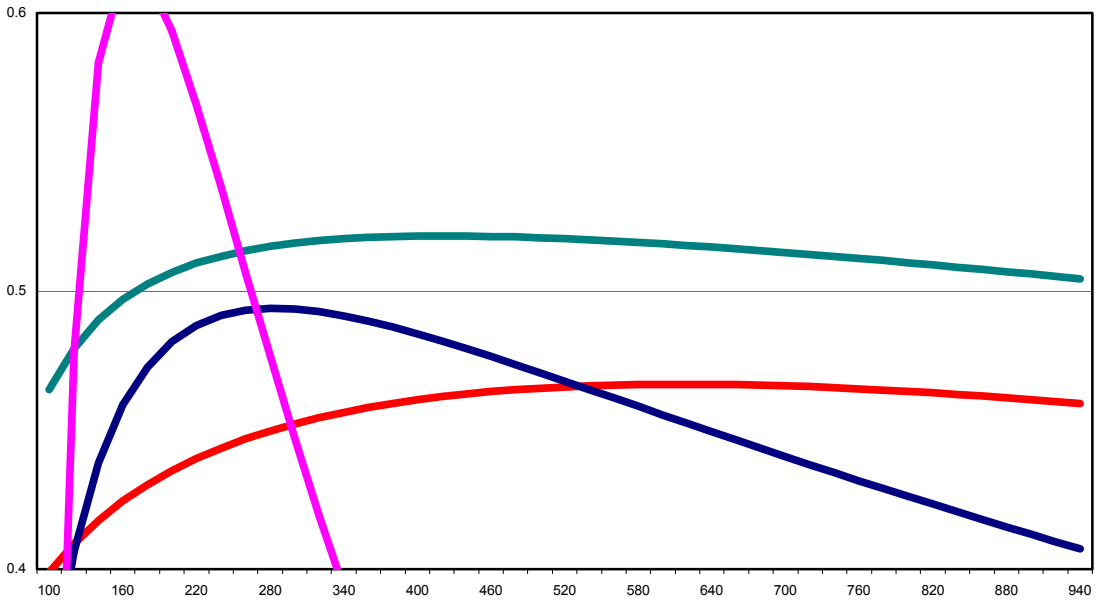
Figure 1. Estimated Kuznets Curves with Alternative Measures of Inequality

A. All Countries



B. Developing Countries

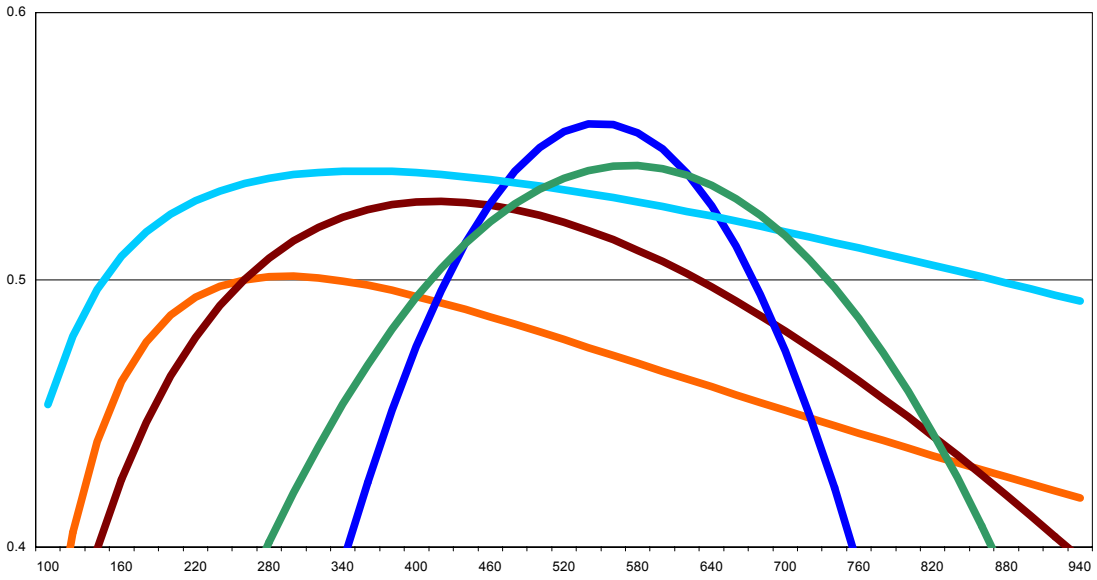


Table 1. A Selection of Country Studies on Changes in Inequality Using Simple Statistics

Article	**Country**	**Data source**	**Data years**
Feenstra and Hanson (1997)	Mexico	Industrial Census (region-industry level)	1975, 1980, 1985, 1988
Hanson and Harrison (1999)	Mexico	Annual Manufacturing Survey	1984-1990
Ros and Bouillon (2002)	Mexico	National Survey of Households	1988-1996
Bell (1997)	Mexico	Annual Manufacturing Survey	1984-1990 (panel)
Robertson (2000)	Mexico	National Urban Employment Survey and Industrial Survey	1987-1995 (quarterly and monthly, respectively)
Gindling and Berry (1992)	Costa Rica	Household Surveys	1976-1989 (annual)
Robbins and Gindling (1999)	Costa Rica	Household Surveys	1976-1993 (annual)
Behrman, Birdsall and Szekeley (2003)	18 Latin-American countries	Household Surveys	1977-1998
Canagarajah, Mazumdar and Ye (1998)	Ghana	Household Surveys	1988, 1989, 1992
Deaton and Dreze (2002)	India	National Sample Survey	1993-94, 1999-2000
Yao (1999)	China	Household Surveys	1988, 1989, 1990 (rural); 1986-1993 (urban, annual)
Kean and Prasad (2002)	Poland	Household Budget Surveys	1985-1996 (annual)
Kim and Topel (1995)	Korea	Occupational Wage Survey	1971, 1983, 1986, 1989

Table 2. A Selection of Country Studies Using Wage or Earnings Regressions

Article	**Country**	**Data source**	**Data years**
Revenga (1997)	Mexico	Annual manufacturing Survey	1984-1990 (panel)
Cragg and Epelbaum (1996)	Mexico	National Urban Employment Survey	1987-1993 (quarterly)
Artecona and Cunningham (2002)	Mexico	National Urban Employment Survey	1987-88, 1992-93 (quarterly)
Feliciano (2001)	Mexico	National Urban Employment Survey	1986, 1988, 1990
Psacharopoulos et al. (1996)	Mexico	National Survey of Households	1984, 1989, 1992
Chiquiar and Hanson (2002)	Mexico	Population Census	1990
Hanson (2003)	Mexico	Population Census	1990, 2000
Pavcnik et al. (2002)	Brazil	Urban labor force surveys	1987, 1992, 1998
Blom Holm-Lielsen and Verner (2001)	Brazil	Urban labor force surveys	1982-1998 (annual)
Arabsheibani, Carneiro and Henley (2003)	Brazil	Household surveys	1988, 1992, 1998
Funkhauser (1998)	Costa Rica	Household surveys	1976-1992 (annual)
Beyer, Rojas and Vergara (1999)	Chile	Urban household surveys and labor force surveys	1960-1996 (annual)
Attanasio, Goldberg and Pavcnik (2003)	Colombia	Urban household surveys	1984-1998 (biannual)
Galiani and Sanguinetti (2003)	Argentina	Household surveys	1992-1999 (semi-annual)
Montenegro (2001)	Chile	Household surveys	1990, 1992, 1994, 1996, 1998
Rozelle et al. (2002)	China	Village survey	1988, 1995
Zhang and Zhao (2002)	China	Urban household surveys	1988-1999 (annual)
Keane and Prasad (2002)	Poland	Household Budget Surveys	1985-1996 (annual)
Lin and Orazem (2003)	Taiwan	Survey of Family Income and Expenditure	1978, 1981, 1984, 1987, 1990, 1993, 1996
Gindling, Goldfarb and Chang (1995)	Taiwan	Labor force survey	1978-1991 (annual)

Table 3. A Selection of Country Studies Using Regressions and Inequality Decomposition Methods

Article	**Country**	**Data source**	**Data years**
Sanchez-Paramo and Schady (2003)	Five Latin-American countries	Labor force surveys	Various years
Bourguignon, Ferreira and Lustig (2001)	Mexico, Brazil, Taiwan, Indonesia	Household surveys	1980-1995
Alarcon Gonzalez and McKineley (1997)	Mexico	National Survey of Households	1984, 1989, 1992, 1994
Cortez (2001)	Mexico	National Survey of Households	1984, 1989, 1992, 1996
Bouillon, Legovini and Lustig (2003)	Mexico	National Survey of Households	1984, 1994
Fairris (2003)	Mexico	National Survey of Households	1984, 1996
Green Dickerson and Arbache (2001)	Brazil	Household surveys	1981-1999 (annual)
Gindling and Robbins (2001)	Chile and Costa Rica	Household surveys	1974-1990 (Chile) and 1987-1995 (Costa Rica)
Contreras (2003)	Chile	National Characterisation Survey	1990, 1996
Gindling and Trejos (2003)	Costa Rica	Household surveys	1980-1999 (annual)
Gonzalez-Rozada and Menendez (2002)	Argentina	Household surveys	1991-2001 (semi-annual)
Fields and Yoo (2000)	Korea	Occupational Wage Surveys	1976-1993 (annual)
Kang and Yun (2003)	Korea	Occupational Wage Surveys	1980, 1994, 2000
Gustaffson and Li (2000)	China	Urban Household Income Surveys	1988, 1995
Park et al. (2003)	China	Urban Household Income Surveys	1988-1999 (annual)
Brainard (1998)	Russia	Household surveys	1991, 1994

Table 4. A Selection of Studies on Mobility

Article	Country	Data years	Number of periods	Observations per period	Sample properties	Macroeconomic environment
Jalan and Ravallion (2000)	China	1985-1990	6	5854	Rural South-West	Stable GDP
McCulloch and Baulch (2000)	Pakistan	6/1986-11/1991	5	686	Rural	Growth
Suryahadi, Widyanti and Sumarto (2003)	Indonesia	8/1998-10/1999	4	10640	Rural, country-wide	Stable GDP
Litchfield and Justino (2003)	Vietnam	1992/93-1997/98	2	4303	Rural, country-wide	Rapid growth
Dercon and Krishnan (2000)	Ethiopia	1994-1995	3	1411	Rural, country-wide	Growth
Muller (2002)	Rwanda	11/1982-12/1983	4	270		Stable GDP
Grootaert, Kanbur and Oh (1997)	Cote d'Ivoire	1985-1988	4	700		Severe recession
Gunning et al. (2000)	Zimbabwe	1982/83-1995/96	2	267	Resettlement farms	Stable GDP
Leibbrandt and Woolard (2001)	South Africa	1993-1998	2	1003	Kwazulu-Natal province	Growth
Woolard and Klasen (2004)	South Africa	1993-1998	2	1003	Kwazulu-Natal province	Growth
Scott (2000)	Chile	1968-1986	2	146	Representative, small farms	Mixed
Glewwe and Hall (1998)	Peru	1985/86-1990	2	699		Severe recession
Luttmer (2001)	Russia	1994-1998	4	2256	Representative	Recession
Luttmer (2001)	Poland	1993-1996	4	4919	Country-wide	Rapid growth
Lokshin and Ravallion (2000)	Hungary	1992-1997	6	1385	Representative	Growth

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